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CURRENT LITERATURE

BOOK REVIEWS

Form and flowering

An interesting discussion of the relations between the vegetative form and the flowering period of plants is presented by Dr. DIELS in a small book,[1] issued more than a year ago, which deserves notice in spite of unavoidable delay.[2]

The questions with which the book deals were raised by the author's travels in West Australia in 1902. After his return he examined the literature and made further investigations to throw light upon the problems of form in the plant kingdom. He has gathered together a considerable number of examples of the relation between form, blooming time, and external conditions. These he presents and discusses in his usual luminous fashion. He has even cited briefly analogous phenomena, not a few from the animal kingdom.

The thesis of the book is that the generative maturity of plants is not connected immutably with a definitive stage of their development, as has been so widely held. A certain minimum of nutritive preparation is presupposed; but once this is passed there is a broad variation zone in which blooming occurs. Its appearance is dependent upon complex, largely unknown conditions, an important part of which, however, are external. The vegetative ontogeny depends upon the cooperation of autogenous and exogenous (an excellent substitute for the awkward term "aitiogenous") factors; for the rudiments of the vegetative organs have many possibilities, and which one is realized is determined by the environment. The mature form of the entire organism is thus a product of vegetative ontogeny and of generative maturity, both of which factors are variable, though their variability is not in the same direction. True, the development of vegetative structures usually ceases at blooming, but this is the only place where the two lines of development, the vegetative and the generative, are inseparably connected. Elsewhere they are free and independent of one another and each varies after its own manner. In this connection of two variable factors lies an important impulse to increase the manifold forms of the plant world. For the conditions which help to regulate the succession of leaf forms and floral maturity change with the changes of climate in space and in time, giving rise to local geographic species and allowing true species to arise in the course of time. Their features attain heritability and become therewith a source of new lines with new possibilities.

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[1] DIELS, L., Jugendformen und Blütenreife im Pflanzenreich. 8vo. pp. 130. *figs. 30.* Berlin: Gebrüder Borntraeger. 1906. *M* 3.80.

[2] The work was sent to a reviewer on its receipt, and was recently returned at our request.—EDS.

A new term, "helicomorphy," is suggested to comprehend GOEBEL's two terms for the two leaf forms in heteroblastic species, the juvenile forms and successive forms. In the course of a short chapter on the phylogenetic significance of helicomorphy, the author pays his respects to the famous "biogenetic law," that ontogeny recapitulates phylogeny, in these terms: "In the botanical field it has absolutely no (nicht einmal immer) heuristic value, and whoever allows himself to be led by it will at most succeed in satisfying the needs of his imagination."

The book is one to be commended to all sorts of botanists; morphologists, physiologists, ecologists, and taxonomists will alike profit by its perusal.—C. R. B.

NOTES FOR STUDENTS

Soil chemics and plant distribution.—Of late the physical character of the soil, and especially the relation of the soil to water, has been more and more regarded as the greatest single factor that determines plant distribution. For this reason the contribution of FERNALD[3] will come to most with something of a shock. FERNALD feels that the dissimilarity of the floras of the alpine districts of New England and adjoining regions cannot be explained by differences in precipitation, exposure, fineness or coarseness of the soil, or water content of the soil. On the other hand, it is possible to divide the alpine regions into three groups on the basis of similar floras. The striking thing that then appears is that the three groups can also be split in the same way on the basis of the chemical nature of the subjacent rocks. One group, including the Adirondacks, Green Mountains, White Mountains, and Mt. Katahdin, is characterized by granites, gneisses, or mica schists, all rich in potassium. The second group, including Smuggler's Notch, Mt. Willoughby, and the Gaspé coast, is characterized by calcareous rocks. The third group includes only the one remarkable area of Mt. Albert, where many plants are found that are known from nowhere else in that part of the continent; this area is one of serpentine. It will thus be seen that FERNALD'S groups correspond to those made long ago in Europe by partisans of the chemical theory, except that the European silicicole group is replaced by FERNALD'S potassium group. It is likely that in a complex world not everything is to be referred to one cause, and perhaps we have been too ready to see in soil water the answer to all distribution problems. If so, FERNALD'S paper will serve an excellent purpose in giving better balance to our views. Yet it must be remembered that this paper is wholly observational, and it is very doubtful if physical and chemical factors can be adequately analyzed in the field. The trend of recent experimental work is mostly toward physical theories or toxic phases of chemical theories, and until FERNALD'S theories are substantiated by rigid experimental tests, it is doubtful if they can find acceptance. It is well also to call attention to the idea expressed so long ago by DECANDOLLE in this connection, that what holds

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[3] FERNALD, M. L., The soil preferences of certain alpine and subalpine plants. Rhodora 9:149–193. 1907.